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THE INDIAN HIDE AND LEATHER TRADE

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Source: *Journal of the Royal Society of Arts*, MARCH 8, 1918, Vol. 66, No. 3407 (MARCH 8, 1918), pp. 274-285

Published by: Royal Society for the Encouragement of Arts, Manufactures and Commerce

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PROCEEDINGS OF THE SOCIETY.

INDIAN SECTION.

A meeting of the Indian Section was held on Thursday, February 14th. 1918; SIR CHARLES STUART BAYLEY, G.C.I.E., K.C.S.I., in the chair.

THE SECRETARY of the Section announced that Lord Islington, who was to have presided, had been obliged to attend a Cabinet Committee Meeting, and, therefore, could not be present. Sir Charles Stuart Bayley had kindly consented, at very short notice, to take the chair.

The paper read was—

THE INDIAN HIDE AND LEATHER TRADE.

By SIR HENRY LEDGARD,

Late President, Upper India Chamber of Commerce.

I have in the following paper endeavoured to sketch the history and present condition of the hide and leather trade of India, but a few preliminary references to the cattle of other countries may be of interest, and at the same time serve to illustrate the very important position held by India in the leather markets of the world.

Broadly speaking there are but three classes of hides in the world: the heavy hide, yielding the stout, hard, strong leather from which boot soles, machine belting, harness, portmanteaux, etc., are made; the light hide, suitable for the upper leather of Army boots and many descriptions of civilian foot-wear; the sheep and goat-skins for light foot-wear, gloves, bags, purses, upholstery, certain textile processes, and the innumerable uses to which thin flexible leather can be put. Of these three classes it may be said that India produces the great bulk of the light hides and skins.

It is, however, rather strange that while the British Empire yields the largest quantity of light hides and skins, the British tanner somewhat neglects them, and in the main devotes himself generally to the tanning of heavy hides drawn from foreign countries, notably the Argentine, South America, Italy, and France. We have also a certain quantity of our own unrivalled heavy "market hides" and imports from South Africa and Australia; but, as I have stated, the English tanner draws the bulk of his supplies of this class from outside the British Empire.

In the Argentine the conditions for the production of a perfect hide are more favourable than in many other parts of the world. The vast

herds of oxen are reared primarily for their meat. They are preserved for that purpose alone; they do no work, and when young and at their best are slaughtered. Contrast these conditions with India, where agriculture is by far the most important industry and the steam plough and motor tractor hardly known. About two-thirds of the 300 millions of population work upon the land, and the chief stock-in-trade of the cultivator are his bullocks. They plough the land, level and harrow it, sow the seed, raise water to the soil from the irrigation wells, tread out the grain, and finally cart the produce to market. For nearly all agricultural work the bullock is a necessity. He works throughout the greater part of the year, and the hard life of toil is often recorded on the hide of the dead animal in sores and scratches, scars or other disfigurements. In the Argentine, branding is practised as a means of identification. In India it is regarded also as a cure of various ailments. I have seen brands or sears aggregating 20 ft. in length, and in one case 40 ft. on one hide. Fortunately Indian cows and female buffaloes are rarely worked; hence their hides are generally in good condition. Neither are cows worked in the Argentine, but their hides are inferior to those of oxen, so we find cow hides may be deemed the better material for making into leather in one country and ox in the other. One other comparison is noticeable. In England, in normal times, the hide of a slaughtered animal may be said to represent about one-twelfth to one-tenth of the total value of the beast. In India, under similar conditions, the hide is worth a third; while on occasion, when cattle-feed is scarce and there is a brisk demand for hides, chiefly from Germany, the animals are slaughtered for the value of their hides alone.

The conditions in India to which I have referred tend to lessen the value of the hides. Nevertheless they produce the most suitable and economical leather in the world for the upper parts of Army boots and strong boots for agricultural labourers, miners, railway and postal employees, etc. The German realised this years ago, and some figures I will give you presently indicate the extent to which he acted upon his knowledge before the war, and, in the opinion of a good many, for a very considerable period after the war.

Our Home Government, however, until recently held a different view as to the uses of the Indian hide, and in their pre-war Army boot contracts barred out East India "kips" in favour of the

heavy ox hide. Their inspectors, however, could not always tell the difference in the leather when in the boot, so, in spite of War Office specifications, "kips" were often used, when procurable, to shoe our soldiers. To-day our Government have commandeered these hides in India, are shipping them here, and are begging our English tanners to use them and to build new tanneries and produce all the leather they can for Army boots. Is it too much to hope that they will, before it is too late, go further and take steps to preserve this industry to the British Empire? The Indian hide export trade is not a small one. It ranks fifth in value of the products of India. It actually comes before tea, that magnificent industry of which we hear so much; moreover, are we not all interested in tea nowadays? Why is it that so little is known of the Indian hide trade? It is, as I think I shall be able to show you later, because the business was to all intents and purposes a German monopoly.

It may be interesting to mention that the total value of Indian exports for the year before the war was £162 millions sterling, and that this amount was very largely made up of what are known as the six chief products of India. These six commodities accounted for £142 millions of the total exports, leaving only twenty millions for the less important articles such as shellac, coffee, gums, rosins, metallic ores, oils, spices, dyes, etc. Now, these six main productions rank in order of importance as follows: (1) Jute, raw and manufactured; (2) cotton, raw and manufactured; (3) food grains; (4) seeds; (5) hides and skins; (6) tea. Further, we should realise that, while over four-fifths of the tea exported finds its market within the British Empire, three-fourths of the hides and skins have been shipped to foreign countries.

How necessary, therefore, it will be in the near future to alter this and "to look after our own" is indicated by the result of a recent investigation undertaken by the American Government. From the *Leather Trades' Review* I learn that in their report serious attention has been called to the shortage the world may have to face in the future as a result of the great increase in meat consumption since the war began. It is estimated that the world's meat-producing animals have decreased in—

Cattle by	28,080,000
Sheep ,,	54,500,000
Hogs ,,	32,425,000
	<hr/>
	115,005,000

Before the war the world's supply of hides and skins was barely equal to the demand, and prices were steadily rising. The figures I have quoted indicate a very serious shortage after the war. What will be our position when all the nations are replenishing their depleted stocks if our Indian resources are again in alien hands?

HIDES AND SKINS IN INDIA.

I will now endeavour to confine myself more closely to India and the immediate subject of this paper.

The Statistical Department of India recently published the result of a census of cattle in British India, from which we learn that there were—

Bulls and bullocks . . .	49,000,000
Cows	37,800,000
Young stock	42,900,000
Buffaloes	19,200,000
Goats	33,600,000
Sheep	23,000,000

These figures do not include the Native States, nor are we given the number of sheep in Bengal, or of goats in Madras. Official figures of these are apparently not available, but from the data supplied by the census I think, taking India as a whole, we may conclude that there are in the country 220 millions of cattle including buffaloes, and 80 millions of sheep and goats.

CURING AND PREPARATION.

When an animal is killed, or dies, immediate treatment to preserve the hide is necessary. In the central parts of India, the Bombay Presidency, the United Provinces, the Punjab and Sind, where a dry climate prevails, the hides are usually what is termed arsenicated, *i.e.* they are cleaned of flesh, fat, etc., and sun or shade dried. Before baling for export they are dipped in a bath of arsenic solution and again dried. The arsenic acts as a preservative and prevents insects attacking the hides. This is considered the best method of treatment, as the hides keep well and there are not the opportunities for adulteration or weighting afforded by other cures.

In the damp climate of Bengal, and during the rainy season in other provinces, drying is difficult, so the hides are usually salted. The result is not always satisfactory; often a great deal of flesh and fat is left on the hide to absorb an excessive weight of salt. I have known a dry-salted hide weighing 15 lb., after the soaking in water, dissolving the salt, removing

dirt, etc., which when again dried was found to weigh only 9 lb., or a loss of 60 per cent. The purchase of salted hides on a weight basis under these circumstances is not satisfactory. For this reason, in the United Provinces, where dry arsenicated hides are usually sold per 20 lb. weight, hides salted during the monsoon are valued by the piece, after selection and classification.

CLASSIFICATION OF HIDES AND SKINS.

For many years the Indian Government purchased large numbers of cattle, kept them where troops were stationed, fed them well for about three months, and then slaughtered them to supply beef to the British soldier. The hides from these, known as "Commissariats," were sold by public tender for a year to three years in advance, and these were the best in India. They were branded on the neck with the letter "C," and a number corresponding with the month when bought, and realised the highest prices. Many years ago the Indian Government discontinued buying cattle, but this term "Commissariat" remains in the trade and indicates the highest grade of hide. The next grade, known as "Slaughtered," signified that the hides were from slaughtered animals as distinguished from those which have died a natural death. The third grade was termed "Deads"; and still lower are "Rejections." These trade terms are still used by the chief hide markets in the central parts of India, the Central Provinces and the Punjab—though the classification has changed. For instance Commissariat, though non-existent, still represents the best hides, and "Slaughtered" include the next lower grade of slaughtered hides and the best of those from animals that have died. The hides of Bengal, Maherpore, Chittagong and other districts have each their distinctive characteristics and are classified accordingly.

Of goatskins there are in India several varieties. The best are from the Province of Behar and known as "Patnas." They are fine in grain, and ideal for the production of glacé kid skins. Further east, in Dinagepore, Bengal and Eastern Bengal (including Dacca), the skins are somewhat larger and heavier in grain and texture, but still suitable for glacé kid. Passing westward into the United Provinces and Rajputana we find the skins also larger and rather coarser than Patnas, the lighter ones only of value for glacé kid. The heavier are suitable for "Moroccos" for the upholstery trade, but,

unfortunately, many have holes made by the pricks of thorns on trees where the animals feed. Further north in the Punjab the skins are known as "Amritsars." They are large, strong and heavy, and best adapted for upholstery. In the south, Hyderabad and Deccani skins are of fair quality, chiefly purchased by the Madras tanners, and tanned in Southern India.

THE INDIAN TANNING INDUSTRY.

Before the war about three millions of cow, ox and calf hides yearly were tanned in India and exported. Since the outbreak of war the enormous and increasing demand for leather for military purposes, both for ourselves and our Allies, has entailed special effort on the part of the tanners in the Madras and Bombay Presidencies, the chief centres of the tanning industry. I think I am right in saying that, with the help of the Indian Government and the efforts of Mr. Wright Henderson, an expert specially sent from home, a splendid result has been obtained, as the present production of Indian tanned ox and cow hides is fully double that of the pre-war outturn. This industry is of such value to India that I trust a further expansion may be seen and the development maintained.

The primary processes, *i.e.* softening, liming, unhairing, fleshing and bating generally, resemble the methods which obtained in England until the introduction of labour-saving machinery. In India, where labour is relatively plentiful and cheap, the Indian tanner still adheres to the more primitive methods.

The tanning material chiefly used in Madras and Bombay is the bark of the *Cassia Auriculata* shrub, commonly known as tarwad. It grows to about 6 to 8 ft. in height, and has no trunk, the shoots breaking out a little above the ground. Shrubs of three to four years' growth are cut and the bark removed. Fresh shoots grow and are again ripe for cutting in about three to four years. Trees are usually destroyed when bark is taken from them for tanning purposes, so in this respect there is a distinct advantage in the use of tarwad.

I know of no tanning material more suitable than tarwad where softness and pliability in the leather are desired.

In the Bombay and Madras Presidencies it is the practice only partially to tan the hides, about half tanned according to our Western ideas; no exception is, however, taken to this as the European currier is able to complete the

tanning to suit his requirements, and, perhaps, what is of some importance to him, to add considerably to the weight.

In addition to the Madras and Bombay tanning centres, there are some large and up-to-date tanneries and leather factories at Cawnpore in the United Provinces, well equipped with machinery and under European management. The first was erected over forty years ago by the Indian Government. There, cow and buffalo hides are tanned, curried and manufactured into equipment (other than boots) for the infantry, saddlery for the cavalry, and harness for the artillery and transport. In normal times the entire requirements of these branches of the Army in India are met in this factory. At present, and in addition, enormous quantities are sent abroad.

Later, the firm of Messrs. Cooper, Allen & Co., erected a similar factory for tanning and currying cow and buffalo hides, and the manufacture of boots for British and Indian Armies in India, Egypt and parts of the Far East. The effect of the war has been greatly to increase their operations, and Cawnpore boots are in every part of the world where fighting is going on.

The North-West Tannery is another large and important manufacturing concern devoted to war work.

The tanning materials chiefly used by the Cawnpore tanneries are the *Acacia Arabica* or babul, and *Terminalia Chebula* (the myrabolan nut). For firm leathers babul tannage is very suitable, and can, when toned down with other tanning products, be made to produce excellent upper leather.

There are also smaller tanneries in Cawnpore, and in Agra, Allahabad, Gorakhpur, and Calcutta.

Owing to the great impetus given by the war to tanning, the cutting of tarwad has been very much increased, and I hear there has been a considerable rise in price. In the north, the Cawnpore tanneries have year by year to go further afield in search of babul. Neither of these two tanning agents, so important to the industry, are systematically cultivated. Tarwad is a jungle plant, flourishing in the central parts of India. Babul, a tree scattered over a wide area, chiefly in the northern parts of India, is not ripe for cutting until ten to twelve years old.

Private enterprise will not cultivate the babul tree and wait so many years for a return, nor have I heard of any enterprising Indian tanner taking in hand the plantation cultivation of

tarwad. It is obviously the business of the Indian Forest Department, and I sincerely trust the Government of India will realise the importance of the tanning industry, and assure to it an ample supply of tanning. India can produce the bark, but its exploitation should not be left to private enterprise.

In addition to the tanning centres of Bombay, Madras, and Cawnpore, there still exists, mainly to supply the local needs of the districts, the primitive system commonly known as "country tanning," carried on in the villages. The hides and skins, after the usual preparation, are sewn into a bag, hung up, and filled with water and ground bark. The liquid extract percolates through the hide; twenty-four hours' suspension in the case of cow hides, and forty-eight with buffalo, completes the process. The hides are coloured and look tanned, but a true chemical combination has not taken place. That they are not properly tanned is indicated by the unpleasant smell they give off for a long time. This leather comes to London from time to time in small quantities, where it is known and sold as "stitched hides," or "bag tanned."

Of the three centres of tanning I have reviewed, the Madras and Bombay *Cassia Auriculata* tannage is the largest, and meets an important demand in Europe. The second is a sound tannage, but has a limited market. The third is inferior, only of value where better leather is not available, and will die out as the better tannages find a wider market in India.

Chrome tanning is carried on to a small extent. In this direction there would appear to be great possibilities for India. The adoption of Western attire has led to a considerable increase in the use of boots and shoes of European pattern, and there is no material more suitable for the upper parts of boots and shoes in a hot climate than the soft, flexible leather produced by chrome tannage. Apart from this fact, it is a mineral tannage, and can be extensively developed without adding to the present and increasing demand for the vegetable tanning agents to which I have alluded.

EXPORT TRADE.

I now turn to the export trade, which comprises (1) the hides or skins tanned in India, and (2) the raw hides or skins exported and tanned abroad.

Of goatskins, India, previous to the war, exported annually some 20 million pieces in the raw state and 7,500,000 tanned.

The United Kingdom took the greater part of the tanned skins. They were practically all sent to London and disposed of at the public sales held at intervals of one to two months. About half the skins were re-exported to the Continent, and America took about one-third of the remainder.

The handling of the raw skins was on a different footing. America imported direct about 75 per cent., England 10 per cent., France 7 per cent., Holland and Belgium 5 per cent., Germany an insignificant quantity. Since the war America's imports have risen to 93½ per cent., and ours dropped to 8 per cent. or less.

The very large quantities taken by America are turned into glacé kid, and of these England takes annually from America, for her own use, a considerable proportion, valued at £1,500,000.

Of sheepskins the export in the raw state, previous to the war, amounted to 2,200,000, and about 9 millions tanned. Of these raw skins America took in 1913-14, 87 per cent., and in 1915-16, 96½ per cent. In face of these American figures I do not think it necessary to tell you what England imported. The treatment of the tanned skins is rather more favourable. The following are the figures:—

	1913-14.	1915-16.
United Kingdom	58·9 per cent.	64 per cent.
United States	20·9 „	19·8 „
Japan	15 „	11·8 „

As with the tanned goatskins, a considerable percentage were re-exported to America and to Austria, and then came back to us in various forms of useful and fancy manufactured articles.

Of buffalo hides about 16,000 cwt., or 160,000 pieces, were exported to England in the tanned state. Unlike sheep and goat skins they were nearly all absorbed in the country. Of the 345,000 cwt. raw hides, representing about two million pieces, the position is fully summarised when I say that half the number went to the countries now at war with us, one-third to the United States, the remainder to the United Kingdom, Holland, and Italy.

Before referring to the export of ox and cow hides I should state that efforts are being made to increase the manufacture of glacé kid in this country. The chrome tanners have considered the position, and state that they are prepared to extend their factories and deal with an additional five million goatskins per annum, provided Government give them some security for the capital involved. The Tanners' Federation

consider that such security would be provided by an export duty in India on all raw goatskins, with a rebate of the full amount if the skins are tanned within the Empire. The Federation estimate that the value of the increased production in this country would, within three years of the termination of the war, fully equal the cost of the Indian goatskins treated in America and imported into this country in the form of glacé kid, to which I have alluded.

A similar fiscal policy is suggested in regard to sheepskins, and in both goatskins and sheepskins there is a very considerable industry to be created in this country in the manufacture of fancy leather articles, such as bags, purses, etc., a trade hitherto largely in Austrian and German hands.

The Tanners' Federation have also considered buffalo hides, and, in view of the fact that all imported tanned hides have so far been absorbed in this country, express the view that a very much greater number of Indian buffaloes could be handled here if the trade were established with the certainty of supplies in the future.

I now come to ox and cow hides, by far the most important branch of the hide and skin exports of India. Covering a period of some years before the war, the exports have been approximately 11 millions, of which about 3 millions of hides have been exported in the tanned state, and the remaining 8 millions in the raw. Broadly speaking, the tanned hides came to this country, and the 8 million raw hides went to the Continent. At one time, you may be interested to know, all the hides came here, and kip tanning was a most important industry. From the Leeds district alone the outturn was about 3 millions per annum. Kip, I may mention, is the trade term for Indian ox or cow hides.

In 1872 the shipments to the United Kingdom were 7 millions; to other countries none. Ten years later, in 1882, 5 millions came here and 1 million went to the Continent. By 1892 the figures were almost reversed, for 1,038,417 came to this country and 4,423,159 went to the Continent. For about three years longer our imports held up, and we averaged about 1½ millions against 5 millions to the Continent. In 1896 we dropped to 681,000. Imports continued to dwindle, until in 1913 we imported only 17,530 as against 6,981,947 to the Continent and 261,060 to America.

I have here the details of statistics of exports from Calcutta going back to 1872, but not to

weary you with so many figures, I have summarised them in the preceding column.

SHIPMENTS OF RAW OX AND COW HIDES FROM CALCUTTA.

	To the United Kingdom.	To Continent.	To America.	Total.
1872	7,000,000*	Nil.	Nil.	7,000,000
1882	5,000,000*	1,000,000	„	6,000,000
1887	3,882,443	1,614,363	„	5,496,806
1888	3,552,956	1,645,880	„	5,168,836
1889	3,915,367	1,678,485	„	5,593,852
1890	2,694,554	2,440,315	„	5,134,869
1891	2,444,148	4,301,734	„	6,545,882
1892	1,038,417	4,423,159	„	5,461,576
1893	1,437,317	4,872,637	„	6,309,954
1894	1,591,011	5,628,416	„	7,219,427
1895	1,424,719	5,784,802	„	7,209,521
1896	681,164	5,315,552	„	5,996,716
1897	700,086	6,181,250	„	6,882,336
1898	683,266	6,932,099	„	7,615,365
1899	700,000	6,817,000	335,000	7,852,000
1900†	433,636	9,677,840	464,310	10,576,286
1901	227,748	6,752,912	127,326	7,107,986
1902	90,070	6,035,341	92,340	6,217,751
1903	144,216	6,600,901	97,967	6,843,084
1904	136,794	6,671,278	13,532	6,821,604
1905	174,883	7,719,582	105,007	7,999,577
1906	337,047	9,946,681	331,111	10,614,839
1907	197,569	7,344,460	24,670	7,566,699
1908	215,834	7,081,005	5,760	7,302,599
1909	166,466	7,257,733	26,970	7,451,219
1910	98,772	7,721,097	21,172	7,841,041
1911	135,134	8,159,231	194,100	8,488,465
1912	39,583	7,812,626	801,221	8,653,430
1913	17,530	6,981,947	261,060	7,260,537
1914	154,211	5,676,395	343,096	6,173,702
1915	408,603	4,192,949	1,322,216	5,223,768

GERMAN CONTROL.

The figures I have quoted show that the trade in raw hides had passed from us when war broke out. What the trade meant to the enemy may best be expressed by indicating what these hides would produce.

The ox and cow hides that went to Hamburg, Bremen, and Trieste in the three and a half years before the war, after making the liberal deduction of 50 per cent. for hides unsuitable for military requirements, yielded sufficient leather to make 48 millions of Army boot

* Estimated.

† In 1900 (the famine year) upwards of 3,000,000 raw hides were shipped from Bombay.

uppers, while the buffalo hides exported to the Continent would supply 49 millions of Army boot soles. Of the remainder fully half were suitable for making civilian upper leather (of which a large quantity was returned to us in the form of finished box calf), and for making soles for light boots and shoes or the inner soles of heavier boots. How this complete capture of trade has been accomplished is of interest. In 1876-77 the German Government imposed an import duty on leather of 6s. 1d. per cwt., equivalent to about 6 per cent. *ad valorem*. In 1878 they increased it to 10 per cent. *ad valorem*, and in 1906 the tariff was revised and increased, raising the duties to from 1½d. to 2¾d. per lb. according to the weights of the tanned hides.

Concurrently with these fiscal measures in Germany there arose in Calcutta German firms devoting themselves exclusively to the export hide trade. Before long they had banded themselves into an association or ring almost exclusively German. In case this description of the ring may be questioned, I give you the grounds for my assertion. In 1913 the firms composing this association contained thirty German or Austrian directors, partners or managers, and four naturalised or not German. Of assistants other than Indian clerks, hide sorters, or coolies employed, there were fifty-five German and Austrian and only twelve naturalised or not German. In addition to the association of German hide merchants in Calcutta, a Tanners' Association existed in Germany and a Dealers' Association in Hamburg. The latter worked with the Calcutta ring, and any outsider attempting to do business found himself against the Calcutta association or its counterpart in Hamburg. The Calcutta firms very naturally cultivated intimate relations with their Continental customers, and drew their assistants from Germany or Austria. The hide classifications were made to suit the German tanners. A German line of steamers carried the hides direct from India to the German or Austrian ports. It is true the ring would sell to English tanners or anybody else, but in all essentials it was Germanic in its origin, in its organisation, in its sympathies and ramifications. There was one exception in this co-operative system, and that was in finance, where the German houses apparently found the English banks sufficiently cosmopolitan and wealthy to serve their purpose. If I have wearied you with these details it is from a strong desire that you may understand how

completely the trade was dominated by Germany, and realise the very poor outlook if nothing is done to free us from the German incubus. The fight will be short and sharp, and certainly end in a German victory. The Home Government has apparently given more consideration to the subject than the Indian. Possibly the leather shortage over here has been the stimulus. It is not, I think, unfair to say that the Government of India has so far done little with the weapon in their hands in the shape of the "Hostile Foreign Traders' Order." Shortly after the outbreak of war they ordered the liquidation of four German firms cut of those comprising the ring, but soon, and, I take it, with the knowledge of Government, other concerns started. How the firms affected regard the changes may, I suggest, be inferred from the following extract from a circular of one of them ordered to be wound up under a Hostile Traders' Order—

"There will be no change in the management, and we trust the new company will receive the same measure of confidence and support hitherto enjoyed by ourselves."

The remaining firms composing the German ring have been allowed to trade, some with, some without, supervision.

Possibly, in the early days of the war, to have entirely shut down the European hide merchants in Calcutta might have caused serious dislocation before new markets had been found and new organisations formed, but that reason no longer exists. The Government are themselves the purchasers, with the aid of British firms, of all the available ox and cow hides, and there is in England and in neutral countries an eager demand for such as are not required by the Government.

In February 1916, with the concurrence of the India Office, an influential and representative committee was formed at the Imperial Institute, including representatives of firms interested in this Indian trade, of tanners in this country, and others qualified to consider the future of the trade in Indian kips.

On July 3rd, 1916, a conference was held at the India Office, under the chairmanship of Lord Islington, which discussed a memorandum prepared by the committee setting forth the ascertained facts of the case. It was then settled that the committee should proceed to ascertain:—

1. Whether British firms would be prepared to take up the raw hide trade in India, and purchase the kips for export.

2. Whether tanners in the United Kingdom would be prepared to take up the tanning of the Indian hides on the large scale required.

The results of the committee's inquiries on these two points were entirely satisfactory, and have been embodied in an important report and recommendations presented to the Secretary of State for India, which so far has not been published. British firms in Calcutta of undoubted reputation informed the committee that they would take up the export trade, and stated their views as to the best methods of securing that in future the East India hide business shall be an all-British industry. At the same time they made it quite clear that their entrance and continuance in the business would be contingent upon the complete removal from the trade of German firms, or firms whose antecedents and connections and membership of the German hide ring set them apart from British firms.

Tanners in this country express their readiness to tan these kips on an increasing scale under certain conditions, the most important of which is that the purchasing trade in India shall be in the hands of entirely British firms free from previous or present German connections.

The United Tanners' Federation of Great Britain and Ireland expressed themselves able to handle increasing quantities up to four millions in the third year after the conclusion of the war, subject to:—

1. The imposition in India of an export duty on raw hides which shall be remitted if they are tanned within the Empire.

2. Confining the export of raw Indian hides to British firms free from any German or Austrian connections. (The term "British firms" is meant to include Indian.)

3. The granting, where necessary and advisable, of financial assistance to tanners, adapting their yards or building tanneries to tan East India hides.

In this report the committee also laid stress upon the importance of the fullest development possible of the tanning of kips in India which shall involve the employment of Indian labour and capital in the manufacture of leather goods from Indian tanned leather. Since the committee's recommendations were submitted, the Government of India have employed only British and Indian firms as their agents in the purchase of hides on the Government account. In the background there are, however, still the old ring firms or their successors resenting their exclusion, agitating

for recognition, bringing pressure upon Government, trading with neutrals, and ready to pounce upon the trade (of which they had the monopoly) directly peace is declared and the Continental market re-opens. The Tanners' Federation in this country are under no delusion as to the danger, and recently passed an outspoken resolution to the effect that if "German" firms are included in the buying arrangements in India, and the trade in India is not firmly established in British hands, they will not enlarge their yards and sink capital in order to tan Indian kips.

That is the position to-day of this vast trade. I hope I have succeeded in raising in your minds a desire that it should be retained for the Empire. If I have done so it is incumbent upon me to do more than criticise, and to ask you to bear with me a little longer while I outline a policy that would, I think, give to us at least a measure of that control so long exercised by the enemy.

THE REMEDY.

In the first place, I urge that no German firm, or firm of German antecedents and connections, shall be permitted to remain in this trade. In precisely defining what I mean, I cannot do better than quote from a speech of Lord Islington on July 18th, 1916, in the House of Lords, when dealing with the case of a German firm in Calcutta that had been engaged in supplying manganese ore to Krupps for the manufacture of steel. He then said—

"The Government of India had long prevented hostile firms carrying on business in India for the benefit of enemy interests; but, for the purpose of determining what was a hostile firm, they were taking as a criterion whether a firm's business was carried on before the war for the benefit of an alien interest and was likely to be resumed on similar lines after the war."

In quoting this admirable definition of a German, or pro-German firm, I must, however, be permitted to say I do not altogether endorse his lordship's statement of what the Government of India have done. I would rather suggest that it is what they may do if sufficient pressure is brought to bear upon them.

Secondly, I recommend that no concern or individual should be permitted to be in this trade in India without a licence, and the conditions attaching to a licence shall be—

(a) That the capital of the licensed company, firm, or individual, shall be entirely British. (The term "British," of course, to include Indian.)

(b) That all partners, directors, or managers of such licensed company or firm shall be British, and without German connection.

(c) That no British subject being under direct or indirect control, financial or otherwise, of foreign interests, shall be allowed to have any share of the capital, or be a partner, director, or manager of such licensed company or firm.

(d) That no license to trade in Indian raw hides shall be granted to a company, firm, or individual who before the war carried on, or was engaged in, the business for the benefit of foreign countries taking part in the war against the Allies.

I may point out that, apart from the main object we have in confining the trade to licensed firms, other advantages are likely to accrue. There would, for instance, probably arise an association not existing for the purpose of maintaining a monopoly, but instead devoted to the development and improvement of the industry in the interests of all concerned, as exists in the tea industry.

Mr. Chadwick, in this room on December 18th, drew attention to the extent to which adulteration is practised in India. The hide trade is not immune, and I have drawn attention to certain malpractices. All the excessive weighing, bad curing, bad flaying, etc., and the evils emanating from them, would all come within the purview of the association, and the remedies besought to improve the quality of the hides would increase their selling value, and if, say, only one shilling per hide were added, I leave it to those with a taste for figures to estimate the sum that would reach the pockets of the cattle-breeders and hide-sellers of India.

Thirdly, a careful consideration of the fiscal policy outlined by the Tanners' Federation as essential to the revival of the light leather tanning industry in England and its expansion in India.

There is nothing revolutionary or impracticable in these proposals. They are, in their main features, already embodied in the Non-Ferrous Metal Bill, which has met with general approval and received Parliamentary sanction as a measure of protection in the best sense of the word.

Finally (and in this I have in mind the trade of India as a whole), there should be closer commercial union, some preference or privilege—call it what you will—that will render us more self-supporting and self-contained more independent, and, let me add, more alive to enemy machinations than we have been in the past.

DISCUSSION.

THE CHAIRMAN (Sir Charles S. Bayley) said the paper formed a very valuable contribution to the knowledge at present existing of one of the leading Indian trades, of its growth in the past and of its possibilities of future development. The subject naturally divided itself into two branches—the tanning trade and the export trade in raw hides. The author had shown the importance of the tanning trade by the various figures he had given in the paper, and to that information he would only add that he had been informed that Indian tanned hides were now providing some 60 per cent. of the material required for the upper leathers of Army boots. The subject was one that had claimed the special attention of the Indian Munitions Board, whose vigorous action in controlling the industry could not fail to stimulate tanning in India, and would probably do much to improve the methods at present employed, of which the author had given such an interesting account. The question might have occurred to some whether there were sufficient hides in India to supply both the tanning and the export trade. The author had stated that the recent census of cattle in India showed that in British India alone there were something like 220,000,000 cattle, which proved that for the present at any rate there was an ample supply of hides, and he did not think that there need be any apprehension whatever about the future. England and India were both vitally interested in the tanning trade, and should do all they could to encourage it. Equally they must wish success to the raw hide export trade, and to the endeavours which were now being made to divert that trade to British tanneries. The author had shown that for many years past the raw hides had been finding their way to Germany in increasing numbers, and certainly the position was a very remarkable one. In the year 1887, about 70 per cent. of the raw hides of India were exported to England, but in the year 1913, the year before the war started, the proportion was 02 per cent. He did not know why it was that the English firms had allowed so valuable a trade to pass out of their hands: the fact remained that it had gone, and it was of the utmost importance that the circumstances to which the war had given rise should be used to revive it, if possible. The Government of India had given their fullest consideration to the matter, and had taken exceedingly drastic steps to purge the firms engaged in the trade from enemy influences. The matter, however, was a very difficult one, and there were obviously considerable opportunities for differences of opinion as to the further steps which should be taken. The individual cases mentioned by the author were under consideration, and were no doubt being dealt with as well as possible. The author had advocated certain concessions to the trade, and he was quite justified in doing so. The concessions, might or might not be expedient in themselves, but it was certainly very desirable that the whole matter should be fully ventilated and discussed.

He could not help thinking that anyone who had listened carefully to the paper must see that the concessions suggested would involve very big consequences indeed, and that they also involved the application of certain principles which could not be confined to any single trade. For example, the suggestion that an export duty should be imposed on raw hides shipped from India, and that a rebate should be allowed if the hides were tanned within the Empire, might be a most excellent thing, but there was no doubt that other trades would apply for a similar concession, and it was a matter of high policy whether a general application of that principle would be a good thing or whether it would in any way interfere with the export of raw produce from India in the hide and other trades. That was a point that required careful consideration. Then again, the author had suggested that the export hide trade should be confined to firms of purely British origin, and had quoted in support of that view, a speech made by Lord Islington in 1916. It must be remembered, however, that Lord Islington delivered that speech two years ago, and perhaps he would not say exactly the same thing now. The position had wholly altered during the last two years. In 1916 America had not come into the war; now she was fighting by our side, and the question arose whether we were to treat American firms in precisely the same way as German firms. He thought that if Lord Islington were speaking at the present time he would probably substitute the word "enemy" for the word "alien" in the passage quoted by the author. That, again, was a question of high politics that had to be very carefully considered. All were absolutely agreed as to the great importance of eliminating enemy interests of every kind, and he felt certain that the Government of India would take every step it could with that object in view; but the question of the elimination of all alien firms was a very large one, and one which he at any rate could not discuss at the present time. Everyone could unite in hoping that any conclusions at which the Government of India and His Majesty's Government might arrive would be framed in the best interests of India, of the whole Empire, and of the great industries amongst which the hide and leather trade must certainly be included. It was to be hoped that the present war, with all its disastrous results, would at any rate help to draw the Empire together, and make it self-supporting and encourage and forward its trades in every way.

MR H PERCY DENSHAM (Chairman of the United Tanners' Federation) said the author had mentioned the views expressed by the Tanners' Federation on many points, and since those views were first put forward the trade had progressed still further, and was already producing leather satisfactorily from the East India kip. If the requisite protection, not necessarily in the way of duties, could be obtained, the Federation intended to build up that trade. The chief protection it asked

for was that the handling of the raw material should be entirely in the hands of British firms; without that protection the trade could not be increased. A great deal had been said about the value of the East India kip for Army boots. If this war proved to be the last war, as everyone hoped it would, the leather made from the East India kip would still be very valuable for the civilian trade. The suggestion had been put forward in the paper of an export duty on raw hides shipped from India, with a rebate to users in the Empire, and the Chairman had expressed a doubt whether that would be advisable, seeing that the United States had now joined the Allies. While agreeing that it might be right that our Allies should receive consideration, he thought the first thing we ought to look forward to for the reconstitution of the Empire was the conservation of our raw materials primarily for the people of the Empire, and we had a perfect right to ask for some such consideration. The author had pointed out that the number of live cattle in the world had been seriously reduced, and that there would probably be a shortage of hides. Further than that the consumption of leather owing to the war had enormously increased, and, therefore, there was bound to be a shortage of leather. India was one of the greatest raw material producers in the world, and it was very desirable that that raw material should be conserved for use in the Empire. Perhaps rather more weight had been given to the question of the East India kip than to that of goatskin, but he was glad to be able to report that the glacé kid manufacturers of this country were prepared to go ahead to an enormous extent if a reasonable amount of protection and perhaps financial assistance were given to them by the Government. It seemed absurd that 75 per cent. of the 20,000,000 goatskins produced in India should go to the United States, and that this country should then take from America a large proportion of the glacé kid produced from that material, when the process could quite well be carried on in this country. With regard to buffalo hides, they were useful for many purposes. They were absolutely essential for the making of pickers and buffers for the cotton and woollen trade, and they could be tanned into a sole leather, either by the vegetable or by the mineral process, suitable for wear in dry and sandy climates. The leather producers of this country were prepared to take the matter up seriously, and greatly increase their consumption of that material. They were also anxious that the resources of India herself should be developed; they were not asking to have the raw material at the expense of the Indian Empire. They wanted India to manufacture or semi-manufacture the leather as far as possible, and then they wanted any surplus raw material there might be to come to them. With regard to the vegetable-tanned goatskin, that was absolutely essential for the fancy leather trade, there being no skin in the world which was so adaptable for the manufacture of all classes of

fancy goods. Unfortunately, that trade in the past had been largely in the hands of the Germans, but during the war successful efforts had been made to increase the trade in this country. The war had proved the value of woman labour in that industry, as in others, and woman labour was going to enable this country in the near future to compete freely with the cheaper productions of other countries, and to meet the home demand for fancy leather goods by the products of our own labour.

SIR J. D. REES, M.P., said the issue arising out of the paper was whether the important trade with which it dealt had been released from the German domination under which it had fallen, and, if so, to what extent it had been released. Had those shackles been removed so that the Germans would not be able to take possession of the trade again after the war? He had been personally much interested in the subject, and had asked questions in Parliament as to what was being done about it. The Government of India had placed the matter in the hands of a committee consisting of merchants who had no German taint about them, but there was a feeling now that the Government had somewhat faltered upon its path, and he would like to feel certain that the Government of India and the India Office were determined to rescue the trade from the hands of the Germans. It was a very serious matter that, whereas in 1872, 7,000,000 hides were imported into the United Kingdom from India, in 1915 those importations had decreased to 408,000, and 4,000,000 hides went to the Continent, chiefly to Germany. If the recommendations contained in the paper were carried out, a great deal could be done to foster the cause of British trade in India, which he was old-fashioned enough to think ought to be chiefly in British hands.

SIR EDWARD PENTON, K.B.E., Royal Army Clothing Department (Boots), said this country owed a great debt of gratitude to the author for his untiring energy, his wise advice, and the great help that he had rendered to the War Office since the beginning of the war in regard to the supply of Army boots and the provision of leather. There was no man in the Empire who had a wider experience of leather equipment for the Army than the author, and when the War Office embarked on a very much more extensive use of the East India kip he gave very full information, which enabled them to work with that particular leather satisfactorily. When the war began the Government had two patterns of boots, one made from a British market hide, known as shoe butt, the other from a fully chrome-tanned hide. At that time the upper leather industry of this country was not adequate to supply the amount of upper leather required, and a very large quantity had to be imported; but when, later on, it was decided to use in very large quantities the East India tanned kip, this country

made itself self-supporting as far as the leather required for Army boots was concerned, and it also supplied leather for the boots of a good many of the Allies' troops. The East India kip had been probably more serviceable to this country as a vegetable tannage, because the bulk of the hides were comparatively light, at any rate as compared with the British market hide. Great Britain owed a considerable debt of gratitude to the Indian Empire for the hides, both tanned and raw, that it had supplied, without which we should not have been able to do all that we had done as regards the booting of our own Army and that of our Allies. He agreed with the Chairman that about 60 per cent. of the material required for the British Army boots was obtained from Indian tanned hides. If the members of the tanning trade and of the leather trade generally who were present would go away from the meeting with a determination to do a little self-examination as to why the trade had been lost to such a great extent, he thought the paper would have done a great deal of good. It was probable that the trade had been lost through lack of imagination; there was no doubt that British traders did lack imagination, and very often allowed a trade to slip out of their hands because they could not project their minds into the future and see what would be the result of a certain process. His own view was that the tanning trade slipped out of our hands with the introduction of chrome tanning, when the average British tanner thought he could do a little chrome tanning in an odd corner, whereas the Germans adopted the process on a large scale.

MR. CECIL J. LONGCROFT (Messrs. David Sassoon & Co., Ltd.) thought that the hide and leather trade illustrated what had happened in many other trades. The people of this country had not recognised that in dealing with a trade it was necessary to analyse it and see whether it was of a character that was desirable for the Empire. They had been contented with aggregates of figures and had neglected the making of a careful analysis. As in the case of other trades, this country had allowed the leather trade to pass into the hands of aliens, and had bought cheapness at too dear a price. We had been too much inclined to buy German leather at the very cheapest price, when, with a little more enterprise, we might have produced the leather ourselves. With regard to the export trade, it was undoubtedly in the hands of German firms when the war broke out; the Government found that out because they had either to liquidate or license all the firms in the trade. He thought they ought to have taken their courage in both hands and closed down all enemy firms, thereby giving to the British firms who proposed to start an opportunity to acquire the organisation and the labour that had been in the trade. By reason of the hesitancy of Government, those firms that entered the trade had never felt secure of their position. If a purely British firm were asked to enter the trade they

said, "We have no confidence in the Government; we do not believe that the Government intend to do what they say they will do." A buying committee was set up by the Government in Calcutta, but it had only been in existence for about three or four months when the Government proposed to take action to close it down. It had apparently carried on its work satisfactorily; no charge of incompetence had been made against it, and it imagined that its existence might be prolonged considerably. The committee felt that at the present time it was in a state of suspended animation, because the officials of the Government had not yet declared what their policy would be in relation to the trade. It was very difficult to trace the reasons actuating the Government in adopting their present attitude towards the trade, and especially in their attitude towards purely British firms who had entered the trade for the express purpose of making good the deficiencies produced by the liquidation of enemy firms. Unless that question was approached rather from the standpoint of commercial interests than of official interests the trade would not make the advance it might otherwise do. There had not been a single case in which the Government had had to complain of the shipments of British firms. There had been a reasonable expansion in the trade, but further expansion would be very much hindered unless the Government made up its mind finally to extirpate all German influences. When once a trade passed into British hands it was dealt with in a broad fashion. For example, whilst the Germans were carrying on the trade very little was done in the way of reform, but as soon as British firms entered the trade and got into touch with the Government expert, Mr. Wright Henderson, two or three reforms were introduced at once. First of all, there was an abolition of the unduly complicated classifications of the Germans, who had two or three hundred classifications; and, secondly, at the instance of the Government a scheme had been introduced by which the branding of the cattle could be conducted on much better lines. British traders were not necessarily narrow, as some people supposed, and at least two firms had entered the tanning trade in India with the object of developing that trade in the interests of India. If the Government would take its courage in both hands and see that the trade was confined to purely British firms, they would have no reason to regret it. On the one hand the tanner would be sure of his raw materials, and on the other hand the Government would know that if, in the event of another war, they required a large quantity of leather, they would not be so entirely at the mercy of the German element as they were when the present war broke out.

On the motion of MR. S. B. LEIGH TAYLOR, seconded by GENERAL SIR EDMUND G. BARROW, G.C.B., G.C.S.I., thanks were accorded to SIR HENRY LEDGARD for his valuable paper, and the meeting terminated.

WATER-SUPPLY FOR IRRIGATION AND POWER IN SOUTH-EASTERN AUSTRALIA.

Australia will, sooner or later, be bound to receive emigration on a great scale from this country, and also to absorb the surplus of some of the 360,000 soldiers which she has sent to the war. Hence the extra settlement on the land after the war is concluded is most essential.

The country referred to in this article may be divided into two regions—that moderately supplied with rain, and the arid portion, the former being chiefly adjacent to the coastline and of undulating character, rising in many parts to the magnitude of mountains. The comparatively arid interior, which is the larger in area and fairly level in feature, is for the most part given over to sheep and cattle, whereas the upper country is at present more or less cultivated by tillage. The rainfall in these flat districts is light, but also particularly rich in plant food; the only thing wanting is water. The water must be gentle in its application, like that of light rainfall, so that it may not wash away the soluble constituents of the ground into the rivers, thus retaining them in the soil. The conclusion is plain. The water must come from hills to the plains, by gravitation or pumping, preferably by the former, as the latter is expensive. It should be borne in mind that the supply must be very ample, in order to compensate for the evaporation which takes place in marshes and lagoons under the fierce sun of the interior, to the extent of nearly half an inch daily. So great is this evaporation, that, contrary to the ordinary nature of rivers, in this case the streams contract as they flow down to their outfall, the opening of many road and railway bridges, in accordance with this peculiar feature, being decreased as the river's mouth is approached.

Dr. Johnson's remark as to the possibilities of a Scotchman is applicable, in a special sense, to the youth and the training of such rivers as these, which may be caught by dams while still in the mountains, thus preserving their valuable flowing waters for irrigation, which would otherwise run to waste.

The most important irrigation scheme yet undertaken, and now almost complete, is the damming of the Murrumbidgee River at Burronjuck, New South Wales, the description of which was given in our columns in the summer of 1913. As that is over four years ago, the chief features may now be briefly recalled. The storage dam is of concrete of gravity section, 240 ft. high, the river affording a channel 220 miles long, which gives access to the rich chocolate, but semi-arid, lands beyond, the intervening district needing no irrigation, as it is plentifully watered. The height of the dam is considerable, and therefore very suitable for a power scheme. This may be utilised elsewhere as a gravitation project in South-Eastern Australia, when joy bells are ringing and joy cars are running for peace and plenty. The work has been much